

CAZALMA3D
70 S76

Dept. of Municipal Affairs
Provincial Planning Branch

CA2 ALMA 30 1970S76
Sub-Regional Plan For Fort McMurray, June 1970. 1



3 3398 00139 3817

MAY 13 1974

SUB REGIONAL PLAN FORT MCMURRAY

LIBRARY
VAULT 19

TABLE OF CONTENTS

	Page
INTRODUCTION	
I. THE STUDY AREA: A DESCRIPTION	1
A. Location	1
B. Climate	1
C. Vegetation	2
D. Topography and Soils	3
II. SUB-REGIONAL PROPOSALS	4
A. Market Gardening	4
B. Country Residential Development	8
C. Urban Centre	12
D. Highway, Parks	13
E. Town, Industry and Recreation Development	14
III. SUMMARY	16

PLATS

- Map A Study Area
Map B Land Use and Soils

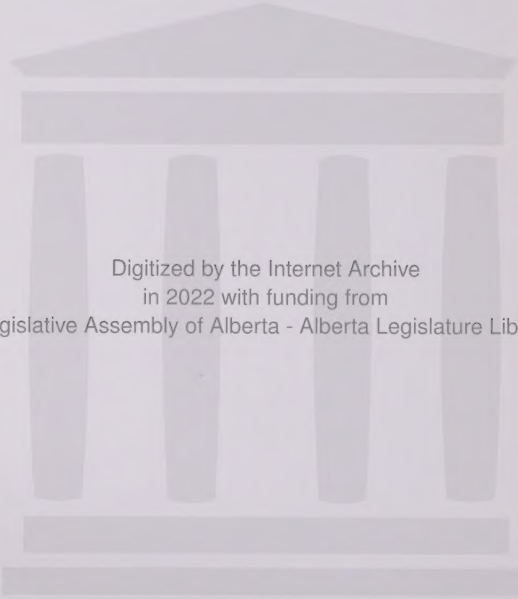
Prepared by:

J.N. Polonuk
A.E. Gordichuk

Research Division,
Provincial Planning Branch
Department of Municipal Affairs

Noel Dant,
Provincial Planning Director

JUNE, 1970



Digitized by the Internet Archive
in 2022 with funding from

Legislative Assembly of Alberta - Alberta Legislature Library

TABLE OF CONTENTS

	Page
INTRODUCTION	
I THE STUDY AREA: A DESCRIPTION	1
A. Location	1
B. Climate	1
C. Vegetation	2
D. Topography and Soils	3
II SUB-REGIONAL PROPOSALS	6
A. Market Gardening	6
B. Country Residential Developments	8
C. Urban Reserve	12
D. Highway Reserve	13
E. Forest, Wildlife and Recreation Management	14
III SUMMARY	16

MAPS

Map A	Study Area
Map B	Vegetation and Soils
Map C	Contour Plan
Map D	Compiled Plan of Study Area
Map E	Leases by Mines and Minerals
Map F	Leases by Lands and Forests
Map G	Land Tenure by Title

FORWARD

Various authorities within the Provincial Government have made requests to the Provincial Planning Branch for information on land use policy leading to the future development of areas of land immediately south and southeast of Fort McMurray. The inference was that an entire new study should be undertaken providing recommendations for the type and intensity of future land use practices; particularly for country residential and intensive agricultural operations.

Despite the fact that extensive limitations on arable land exist, the Department of Lands and Forests specify that private concerns have recently submitted settlement intentions for small parcels within the area in question. Although such inquiries have been few to date, the demand for developing the periphery area is expected to increase. Since Fort McMurray reached new town status in June of 1964, and up to the present time, the Department of Municipal Affairs together with the town's administration has permitted almost no development within the town's immediate periphery. However, because of recent pressures for change in land policy, and in the wake of perhaps additional large-scale industrial developments, the Planning Branch feels definite steps toward an overall land use policy for the periphery area should now be formulated. To help reach this objective this paper sets forth planning proposals for a study area which is analyzed as a subregion of Fort McMurray hinterland.

The information in this brief is a synopsis of available material,

INTRODUCTION

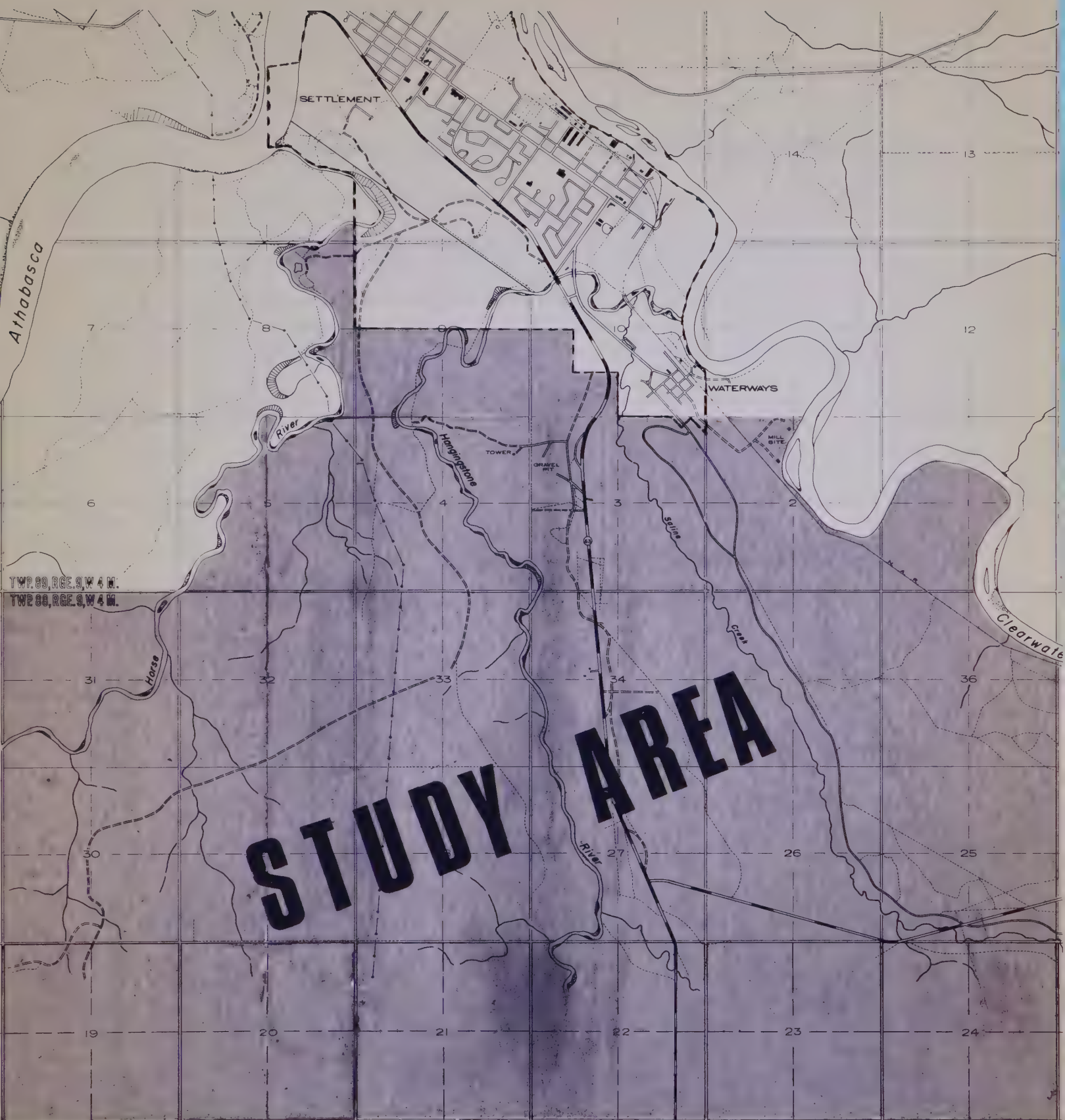
compiled by the Research Division of the Provincial Planning Branch, Department of Municipal Affairs. Modifications or adjustments of policy recommendations may be required as additional data becomes available. For example, a land inventory and soil capability analysis is to be carried out in the McMurray periphery by a project team under T.D. Lindsay of the University of Alberta (Soil Survey Department). It would have proven helpful had the results of such a survey been available well in advance of this paper.

INTRODUCTION

Orderly growth and the economic development of urban and rural land must be based upon sound planning and the application of consistent policies to meet local situations. The unguided, unco-ordinated action of government agencies and individuals can result in the misuse of non-replaceable land resources.

This report recommends policies on the regulation and use of raw land within the selected study area. The conservation of natural amenities and the preservation of developable land (in the form of agricultural, urban residential and country residential) form the basis of these policies. Relative to a predominance of desirable characteristics and to varying degrees of utility, the study area is divided into five special land use districts; Market Gardening, Country Residential, Urban Reserve, Highway Reserve and Forest-Wildlife-Recreation Management. In addition, recommendations and proposals are made designating the function of each special district in relation to those major policies previously mentioned.

The defined study area encompasses only a part of Fort McMurray's fringe in which the formation of policies is becoming urgent. Access and land ownership in the fringe area north of the Clearwater and west of the Athabaska Rivers are such that the formation of land use policies can be delayed without injurious effect.



**FORT McMURRAY REGION
MAP A**



NOV. 69

0 1/2

I THE STUDY AREA: A DESCRIPTION

A. LOCATION

The study area extends to five and one half miles southeast from Fort McMurray, starting from the town's southern corporate limits. The western portion borders the Horse River; the north and northeastern portions are marked by the town limits and Clearwater River respectively; and the southern portion stops just beyond the airport road - Highway 63 Junction. The shaded sector on Map A indicates clearly the study area proper. The townsite of Fort McMurray 89-9-W4, is located on the flood plain in the valley at the confluence of the Athabasca and Clearwater Rivers.

Fort McMurray, the influential factor of the study area, is located in the northeastern portion of Alberta, 240 miles north of Edmonton, 50 miles west of the Saskatchewan-Alberta boundary, and 220 miles south of Alberta's northern boundary. Both Highway 63 (an extension of Highway 46 from Lac La Biche) and N.A.R.'s northeastern rail line, terminate at Fort McMurray via an Edmonton origin.

B. CLIMATE

The climate is characterized by a transition from the Prairies to the Northern climatic regions. The summers are pleasantly warm. The mean daily temperature (May to September) ranges from 47 to 60° F. throughout. The mean daily January temperatures range from 4 to 5° F.

Winds are generally prevailing from the northeast and northwest in

UNDEVELOPED

AREA

UNDEVELOPED

AREA

UNDEVELOPED
AREA

BLACK SOIL

Sites

a b c

TERRACE

LANDS

BRUSHLAND

ORIGINAL SETTLEMENT

ELEVATED PLATEAU

heavily stocked
black spruce &
deciduous

sandy clay, glacial till
and traces of
lodgement clay

sparsely stocked
continuous peat-soil sands

medium stocked,
medium
Escher Development

jack pine &
birch

jack pine
recent fire zone
heavily leached, unorganic
sandy soils

PEAT MOSS

AREA

FORT McMURRAY & VICINITY

SOIL & VEGETATION

PROVINCIAL PLANNING BRANCH

SCALE: 1" = 1 MILE

JANUARY 1970

MAP B



the winter at an average speed of 10 m.p.h. Summer winds prevail from the northwest and west at a similar speed.

The amount of precipitation, much of which falls in the warm season, places the area in the sub-humid to dry realm. The average amount of precipitation ranges from 14.0" to 17.3". The mean frost free period ranges from 90 in the southwest to under 60 days in the extreme east and north. The growing season (average number of days with average temperature over 40° F.) varies from 160 to 140 days. The mean annual snowfall is approximately 47.2 inches, which is considerably less than in areas in central Alberta.

C. VEGETATION

The study area carries a combination of mixed deciduous and coniferous woodland, within which concentrations of moss bogs, peat and sedge bogs appear. More specifically, the study area is generally heavily stocked, particularly with poplar, jack pine, birch, white and black spruce as indicated on Map B.

The plateau region spanning the Hangingstone and Horse Rivers, due to its better drainage characteristics (grey wooded clay deposits) possess an abundance of spruce and birch. The river terrace section is equally heavily wooded owing to its highly organic black soil deposits. In the areas immediately south and north of the airport road, and in areas adjacent to the McMurray highway, vegetation is sparsely stocked. Severe fire burn-outs account for the former area; the latter is due mostly to man's

encroachment (strip mining, small agricultural holdings, garbage dumping and utility parcels).

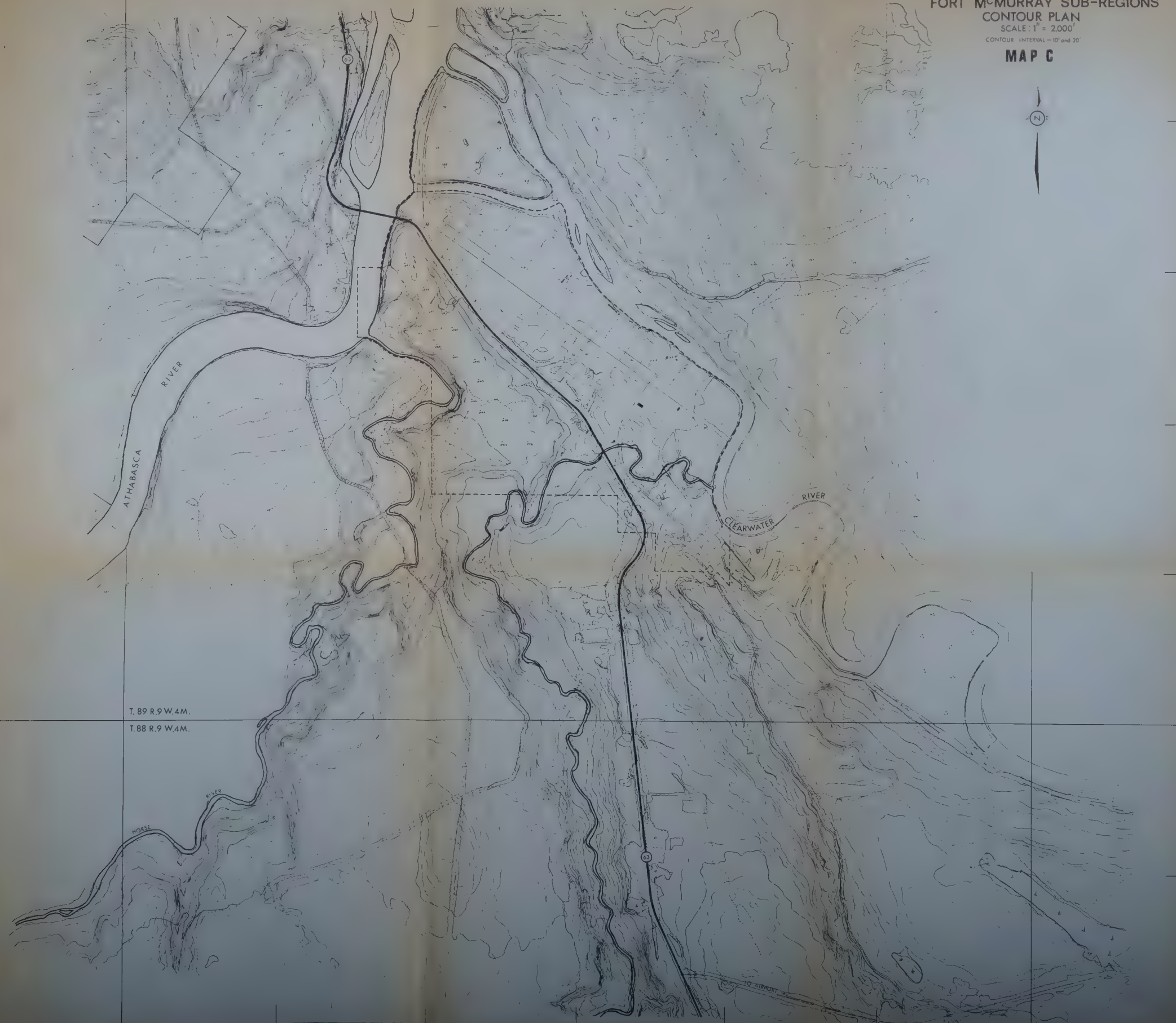
Foliage or vegetation conditions in the Fort McMurray regions are not unlike typical northern regions where soils are affected adversely by soil structure. The permeability depth of rooting zone is also typically restricted by conditions other than wetness or consolidated bed rock.

D. TOPOGRAPHY AND SOILS

The surface of the study area underlain by bituminous sands, may be described as a peneplain, much of which is covered by clay, sand, swamps and muskegs. This is a stream dissected or troughed plain which subsequently has been modified or strongly dissected by gullies formed by streams flowing into the Athabasca River. Consequently the Athabasca and Clearwater Valleys and to a lesser degree, the Horse and Hangingstone Rivers constitute the chief topographical features of the area. Map C indicating the contour plan demonstrates the complexity of surface configuration adjacent to the noted river systems.

Soil formations in the sub-region are subjected to two main ingredients, sand and gravel. Podzol sands are strongly indicated in areas located adjacent to and east of the McMurray Highway (Map B). The material is of out-wash origin, laid down by stream flows through or away from melting glacial deposits (glaciofluvial), and derived from Precambrian Sandstone lying east of the 4th Meridian. One of the original bituminous explorers, S.C. Ells, described this area as an alluvial plain containing five million

FORT McMURRAY SUB-REGIONS
CONTOUR PLAN
SCALE: 1" = 2,000'
CONTOUR INTERVAL - 10' and 20'
MAP C



T. 89 R. 9 W. 4 M.
T. 88 R. 9 W. 4 M.

TO AIRPORT

tons of commercial grade sand, glaciofluvial deposits typically include narrow knife shaped ridges (eskers) and hard broad sand areas or outwash plains. It appears as well, subsequent ice advances deposited clay till creating friable clay-sand mixtures. There is little sand and gravel drift or dune formations. The abundance of bituminous sand originated during the lower Cretaceous Age, hence does not affect surface topography in the study zone.

The elevated plateau region spanning the Horse and Hangingstone contains little homogeneous till of post-glacial deposits. Much of the till is impermeable basal till (logement till) or a mixture of a sandy clay glacial till and sandy outwash. Clay capped kame landforms, with its broad rolling surface, indicates this mixture. It is broken locally by moderate to gentle slopes which reflect the kame topography of the underlying sand and gravel deposits. This contributes to the site's consistency in gradual slope, more so than the remaining study area.

The Clearwater site deposits, consist of a level river terrace surface, with minor river scars, and some evidence of recent flooding. This site is elevated some 10 to 18 feet over the Clearwater River. (Clearwater elevation: 800' $\pm$). Soils, which have been recently deposited contain little profile development. An abundance of black spruce and mixed deciduous stock the surface. The soil type, technically called Orthic Regosol, is ideally suited for garden crops. Its common characteristics indicate its versatility; black, friable, silty, highly organic, adequate levels of litter decomposition

and containing a PH7 (neutral) base. This deposit appears as the only raw sector suitable for crop agriculture in the study area.

In the remaining areas of the study region, Podzol sands or the Podzol Grey Wooded soils are far less fertile. For the most part, they are heavily leached, deficient in nitrogen, phosphorus, organic matter and sometimes sulphur. Their greyish Ae horizons ranging from 6 to 8 inches are extremely platty and heavily leached. Due to cooler temperatures, shorter growing seasons, lower evaporation rates, moss bogs, and the influence of forest fires (which has altered the humus balance), it seems certain crop agriculture will not be feasible. Where lodgement clay exists, the low moisture regime allows little free water movement and an obvious low productivity rating results.

Numerous peat or muskeg areas are to be found in Fort McMurray's periphery, however, concentration of "highmoor" or "moss" peats are found just south of the proposed Highway Reserve district. The area marked "Peat Moss", Map B, is underlaid by clay lime enough to hold moisture which encourages the growth of sphagnum moss. Experimental work with peats or muskegs indicate that some uncertainty exists in determining the best methods of reclaiming them for cultivation. Shallow peats exist within the area in question (allowing roots of common crop plants to penetrate the underlying mineral soil), hence satisfactory soils when reclaimed could be quite feasible. Following drainage, reclaiming calls for stock to tramp and pasture it for two years, allowing peat materials to settle. Finally the land is broken, plowed, and packed to make a firm seed bed.

FORT McMURRAY SUB-REGIONS

CONTOUR PLAN

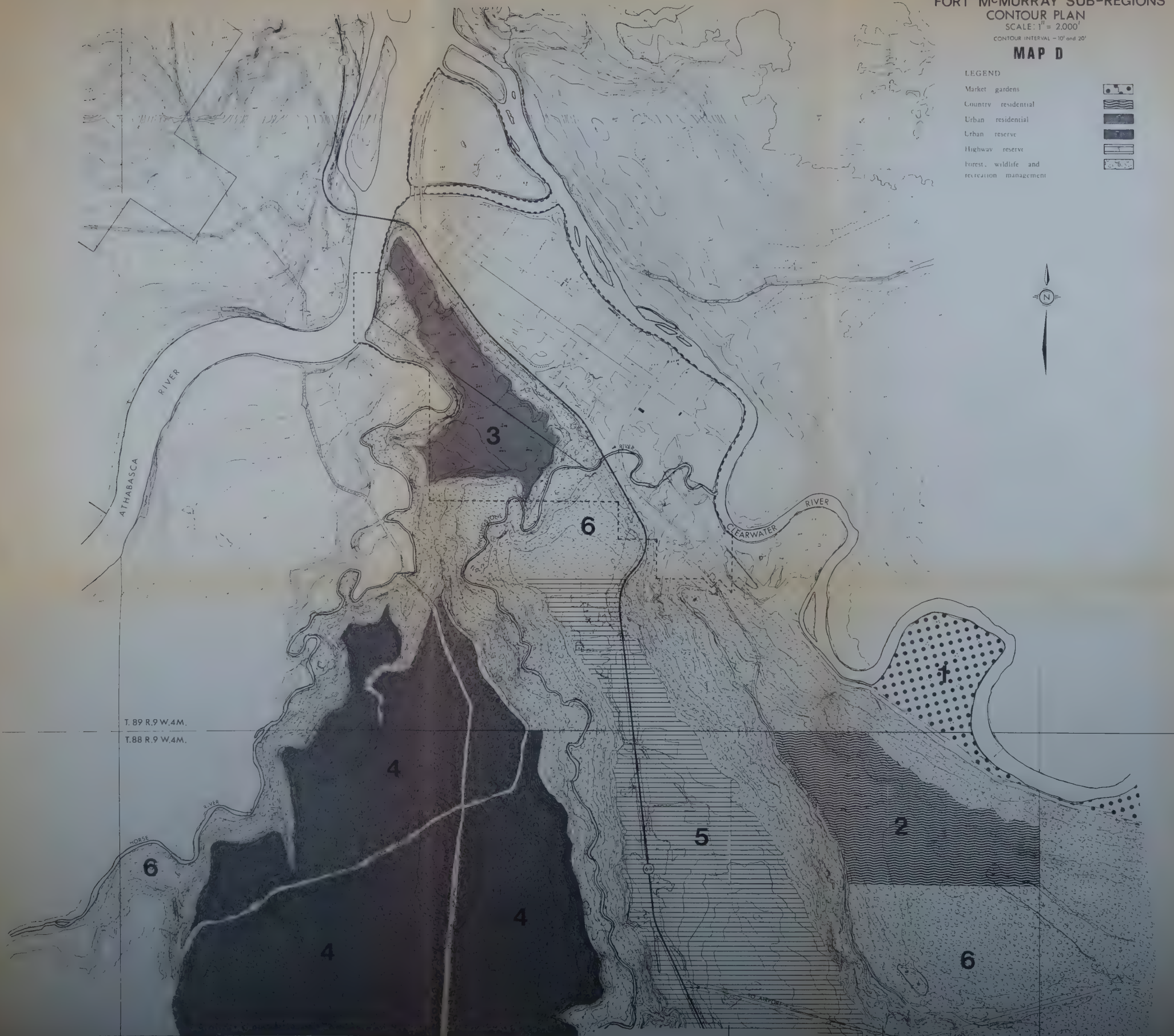
SCALE: 1" = 2,000'

CONTOUR INTERVAL - 10' and 20'

MAP D

LEGEND

Market gardens
Country residential
Urban residential
Urban reserve
Highway reserve
Forest, wildlife and
recreation management



II SUB-REGIONAL PROPOSALS

A. MARKET GARDENING

The town of Fort McMurray is physically isolated from Alberta's main populated regions. The town is equally restricted from the major agriculturally productive areas. Local consumers rely heavily on imported products, particularly food stuffs. In order to relieve both the demand or costs of imported food stuffs under the pressures of a growing economy, measures must be taken to protect scarce productive lands located in the study area. It is recommended that Site I, (Map D) should be held in reserve as a special district for market gardening purposes.

Relevant to all known information, lands having agricultural potential in the McMurray areas are virtually non-existent; except for the Clearwater River terrace lands. As previously mentioned, the area is by far the most suitable for crop agriculture. The objectives of a protective agricultural site should first consider the creation of a specific number of farm units, controlled or leased by a Provincial authority for the production of garden crops at an intensive scale. The number of market gardens would, of course, depend on the estimated consumer demand and alter thereafter. Crown property is ideally available at Site I, (Map D), thus reducing the time involved for the initial starting phase of development.

With the development of Site I, and with the prospect that future agricultural needs are anticipated to reach beyond the capabilities of Site I, then an obvious decision would be to consolidate additional terrace lands. The remaining terrace parcels, located in an easterly direction, and

marked Sites a, b and c, on Map B, are as conveniently located and physically rich in soil content as Site 1. The agricultural development of these remaining parcels should occur in an easterly direction beginning with Site a, and continuing to b, and c as additional land is required.

The immediate hindrance with respect to these remaining parcels is the matter of land acquisition. The Government should control the market gardening areas, as private uncontrolled development might either jeopardize the successful control of erosion along the river's edge or adversely strip forest cover. In addition, a major problem in these low areas is a flood hazard. Residences should not be permitted to exist within the flood plain.

The terrace sites a, b and c, are privately owned by title (predominantly N.A.R.) and except for the Community Draper, they are undeveloped. Negotiations with N.A.R. officials should be undertaken for the purpose of acquiring control of the remaining three sites. It is recommended that the Government purchase the property and thereafter, control the lands through a lease basis. Ultimate acquisition costs would be minimized if a program of controls (reserve zoning) were developed well in advance to avoid land misuse.

B. COUNTRY RESIDENTIAL DEVELOPMENTS

General Proposal

A significant proposal for the Fort McMurray study area will recommend that lands be reserved for purposes of country residential home sites. It is proposed that the non-arable, and crown owned view sites, indicated on Map D as Site 2, should be given primary consideration. These developments will be expected to conform to standards based on eliminating various administrative and financial problems experienced near other urban centres in Alberta.

Towns in Alberta when confronted with a lack of adequate space for residential use, are at times faced with accommodating people who desire a residence in the country. In addition to this, increasing per capita income makes it possible for people to afford the higher costs of country living. Where country residences spurt up in piecemeal manner, and within a region lacking some overall plan, ultimately additional municipal expenses or administrative headaches may occur. Typical problems include fragmentation of arable lands, groundwater shortages, roadway costs, garbage disposal, property appearance, school buses, and the loss of potential revenue for the adjacent town.

Site 2, (Map D) is suggested as being the most feasible location. Justification for this area is as follows:

Proximity to Fort McMurray - Site 2 lies one mile to the southeast, such a distance offers few problems in terms of travel-time.

Road Network - Pre-existing routes with direct access to a main artery offer country residences the greatest single attraction in many ways. The old airport road leading from Waterways in a southeasterly direction forms the western boundary for Site 2. The road under suitable weater conditions, is presently passable. However, a reconstruction scheme would be necessary maintaining it as an all-weather road. Improvement District No. 18 would authorize road maintenance so discussions with the Field Service Branch should occur well in advance.

NOTE: Services such as water, sewer, utilities and garbage collection are not provided and seem too costly because of low consumer densities. Usually the resident is forced to provide these through his own resources. With Site 2 having good proximity and pre-existing roadway connections some major costs of development may be reduced.

Physical Conditions - Site 2 offers well treed view sites, located on hilly topography. The area could provide the resident with an uninhibited rural environment, with privacy and seclusion. Site 2, elevated approximately three hundred feet above the Clearwater River Valley has a beautiful panoramic view. Steep grades, which present special problems to building construction (erosion, lateral sewage seepage) exist but just beyond them are flatter surfaces suitable for housing.

The site is not considered wet, and contains adequate slop drainage. For soil texture, Site 2 is more consistently a sandy-gravelly area.

It would adequately facilitate foundation footings.

Few hydrology tests have been taken in the study area, however, geological reports show the presence of a pre-glacial channel passing through Site 2, along the Saline Creek, then coalescing with the Clearwater River. With this evidence, along with the fact that sand and gravel concentrations normally form good catch basins for leaching fluids, good surfacial groundwater supplies are likely to be present. Tests should be taken for calculating, "available drawdown" (a vertical measure indicating rate of drawdown possible for 20 years). This would aid in planning for residential density. A poultry farm along Highway 63 is operating a thirty-foot well using water softeners for the elimination of iron.

Land Values - It is expected as Fort McMurray expands, real estate values will increase with a more demanding market. However, with the proposed site falling under Crown tenureship, prospective residents can hope for lower acquisition costs. Additionally, exclusive zoning for country residential, would have the effect of reducing inflated, speculative land values which tend to spread their influence far beyond the limits of actually realized increased values.

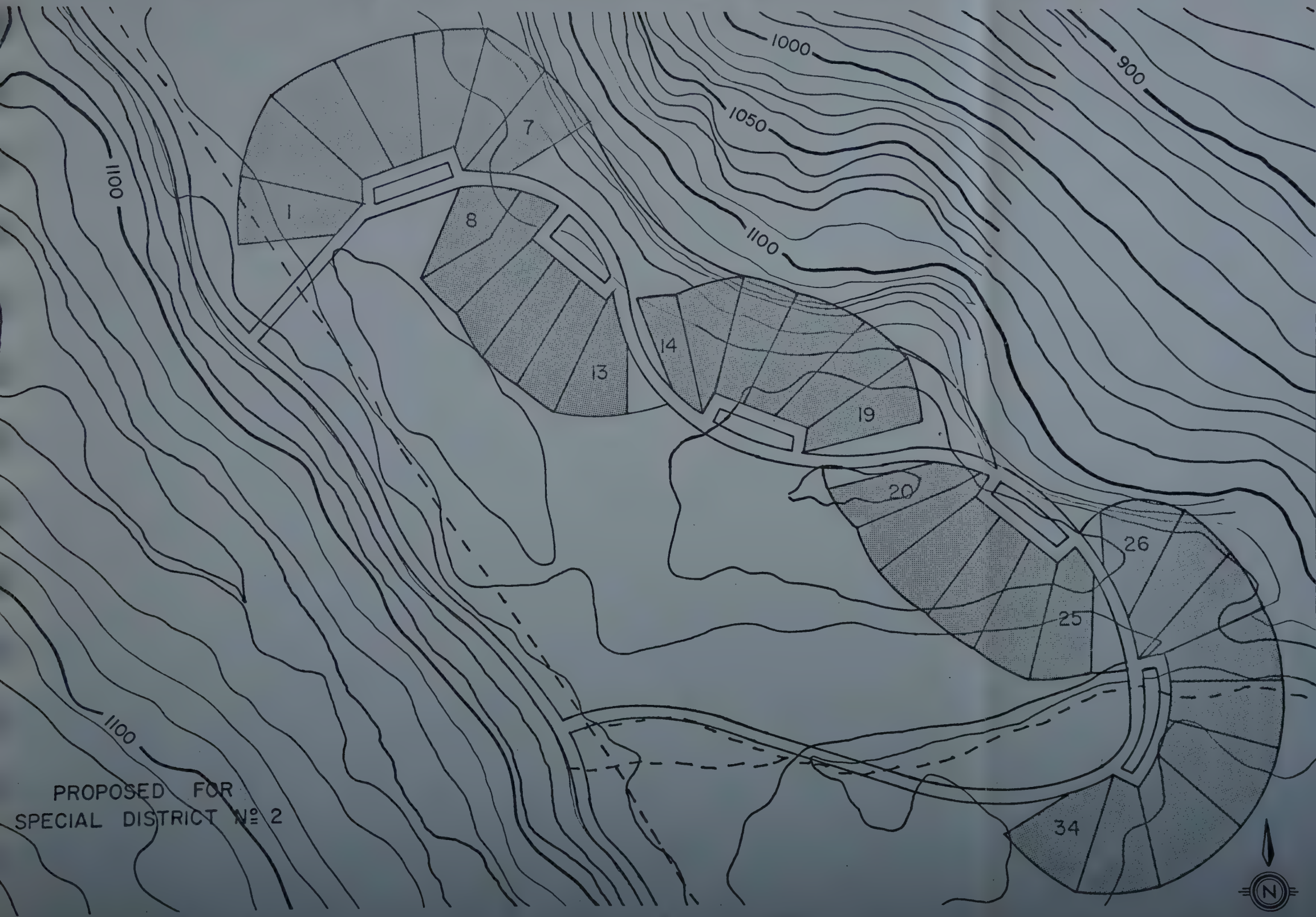
Administrative Controls

Various policies must be developed in order to control or develop a successful residential scheme. The following suggestions should be considered

beyond the standards imposed by The Planning Act and The Subdivision and Transfer Regulation.

- being that the sites are for residential purposes only, country residential holdings be defined as an area of not more than three nor less than one and one-half acres. The minimum frontage to be not less than one hundred feet and not to exceed three hundred feet.
- it must be officially verified that all proposed sites are on non-arable lands.
- standards of buildings should comply with The National Building Code.
- discourage any further resubdivisions, or resale for purposes other than country residential. Policy must resolve against the establishing of smaller residential land units or similarity against the creation of a new hamlet.
- no other activity should take place on the site in question until such time as a pre-determined number of developers are willing to proceed. In this respect, both public and private costs can be kept lower, when compared to a piecemeal development. A country residential scheme is feasible as long as the servicing costs fall principally on the owner, and it is to the owner's benefit if he absorbs these costs collectively with others. Ideally, a country resident should be less of a burden proportionally on municipal resources than the city resident is on city resources.

FORT McMURRAY SUBREGIONAL PLAN



PROPOSED FOR
SPECIAL DISTRICT № 2

PRELIMINARY ILLUSTRATION FOR DISCUSSION ONLY

C. URBAN RESERVE

A salient recommendation in this brief, suggests that lands titled 4, Map D, be withheld from any major developments until definite projections on Fort McMurray's residential growth is established.

The influence of Great Canadian's oil plant and related activities has caused a population boom exceeding 4,000 persons since 1965. Land parcels, capable of harboring large scale subdivision programs, are nearly exhausted within the town proper. Town officials are laboring with the fact that additional land parcels facilitating over 3,000 persons might be required if another oil extraction plant came into the region. Consequently Site 3 located within the southern corporate limits, and on the elevated plateau, is being tentatively considered for a comprehensive residential site.

The area titled Site 4 contains approximately 400 acres, of non-arable land, with a 2% slope increase from north to south respectively. Designing for high density residential could be a problem with the existing G.C.O.S. pipe line, requiring a 50 foot right-of-way on either side of it. However, successful subdivision designs have been used elsewhere, such as in south-west Edmonton, along the Trans-Mountain line. Tentatively, Site 4 appears to be the most suitable and obvious location for high density residential development. This brief asks that any decisions governing development activities on Site 4 be held in reserve.

D. HIGHWAY RESERVE

Perhaps the most striking and often disfiguring use of land is that of highway strip-commercial development. Together with large traffic volumes and the highway's proximity to the urban centre, a main traffic artery becomes a forceful attraction for strip commercial development. Fort McMurray's regional road connection lies through Highway 63. Lands lying adjacent to the highway and lying north of the airport road junction (Site 5) would therefore be subjected to adverse change. It is proposed that Site 5, Map D, titled Highway Reserve, be held as a confined area of land, void of all development or private ownership except for recreational purposes, (which preserve natural amenities).

The increasing density of traffic brings with it an elaborate set of external diseconomics. The general picture is one of enhanced value and intensified use of land. The highway improvement increased the actual or potential marginal productivity of the land it serves. A large number of structures intended to service this traffic could evolve; filling stations, motels, grocery stores, beer parlors, miniature golf courses, etc. In addition to this, an array of exits and entrances could contribute to congestion, and a general unwanted appearance.

Two existing land uses occur in Site 5. An egg-poultry farm and residence is located mid-way between the airport junction and the town's southern boundary on the west side of Highway 63 (Pt. L.S.D. 11 of Section 34-88-9-4). The owners maintain a Miscellaneous Lease issued for a term of 15 years from the 24th of August, 1967. They are presently attempting

to purchase and expand this operation. Allowing such a purchase would lead to additional similar operations, haphazardly located and conflicting with the policy of Site 5 proposals against private ownership. In the case of the poultry farm (M.L. 2725), it is recommended a site investigation take place, concerning the farm's potential, and therefore substantiating any further action on the part of the Government.

Secondly, a score of Sand and Gravel Leases, indicated on Map F, are located in Site 5. Typically in remote regions, extraction industries often seriously disfigure the landscape. With Site 5 a great deal of the extracted materials have been used for local road improvements and therefore an indirect benefit to the economy. However, gaping holes, pits, and abused vegetation have remained as visual deterrents along the highway. Removal of Sand and Gravel Leases must be severely reviewed. Certainly the granting of additional leases in the study area as a whole should be terminated. Alternative sand and gravel concentrations exist in abundance throughout Fort McMurray's hinterland.

E. FOREST, WILDLIFE AND RECREATION MANAGEMENT (F.W.R.)

The quality and character of the study area relative to its physical determinants - the soil, slope, vegetation and hydrologic patterns, cause it to lie conducive to open space requirements. The quality and extent of idle land (sites marked 6) should be retained as open space parcels, preserved and administered for recreation and wildlife promotion. An open space proposal would serve one basic function: outside of offering recreation amenities, it

can enhance and protect the resource base - air, water, soil, plants, and in turn the animals.

The lengthy intercepting parcels, marked 6 on Map D, appear as buffer zones, separating the proposed land uses. A major objective here, is to manage the wildlife of a district so as to provide optimum population levels, and to provide the public with the opportunity to harvest the annual surplus. In addition, the typical wet lands (plateau and airport road areas) produce marginal vegetation. These should not be cut, since cutting generally favors an increase of moss and soil moisture. More important the open space parcels should not be interfered with as a whole. It is apparent that many present day problems of erosion are primarily due to the destruction of natural vegetation. Where there is steep slope, erosion of some kind will occur sooner or later.

It is necessary that Crown controlled protective forests be established on all water courses in order to assure proper maintenance to natural watercourses. Provision must be made, of course, for adequately controlled access to water for farming purposes, particularly if further proposals call for intensive farming sites (feed lot and piggery, livestock, etc.). In many cases, however, the stripping of stream banks can lead to a complete altering of watercourses. This is a severe situation which must be considered as a major proposal.

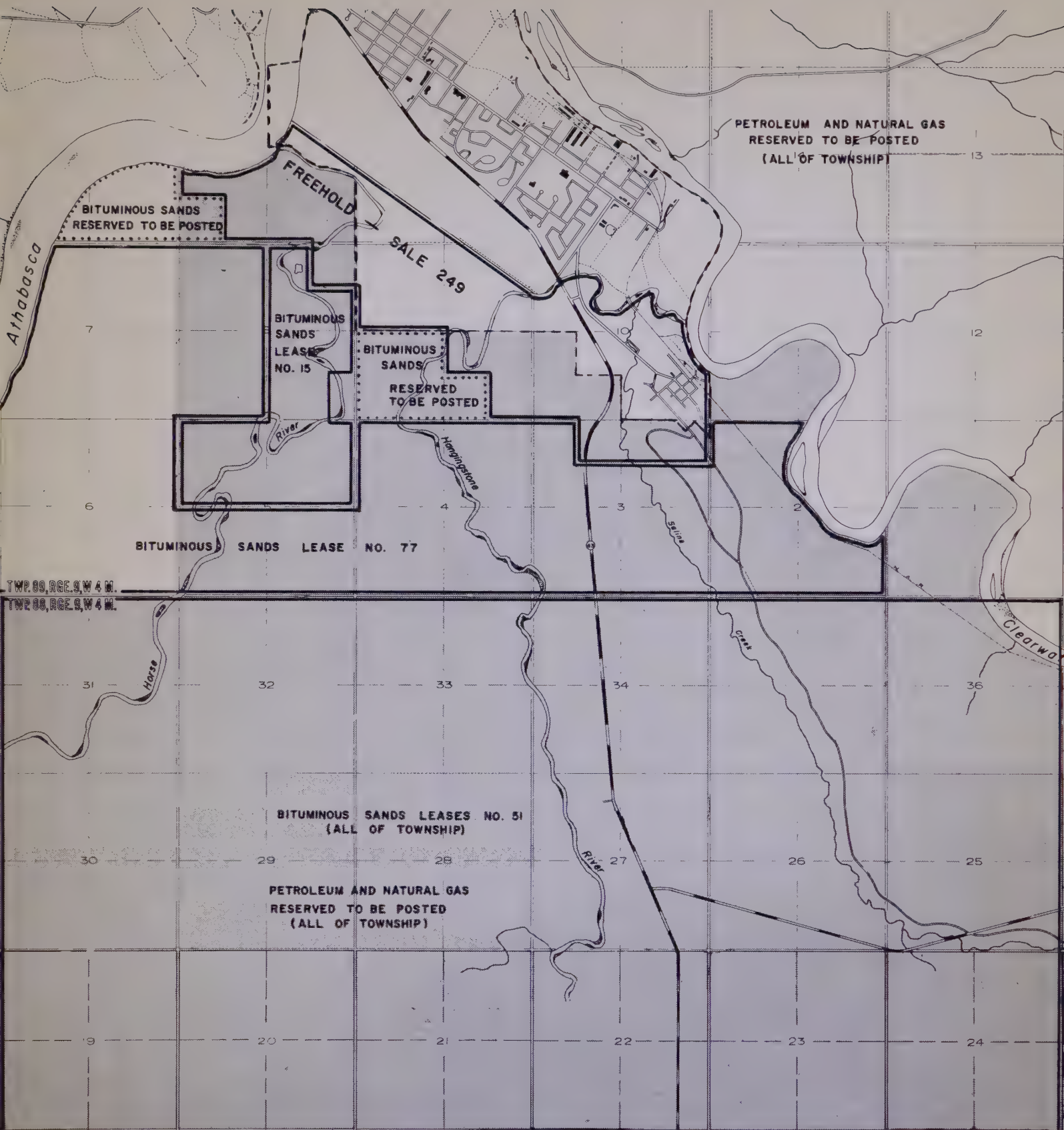
The possibility of outdoor recreation practices (camping, fishing, swimming, etc.) in the study area is promising. Site 6 with its narrow undulating forms provides natural riding and hiking trails. With the

probable rise in public interest for outdoor pursuits, eventually recreation as a major or dominant use could be conveniently confined to smaller areas within sites marked 6.

III SUMMARY

- Lands and Forests have received applications for the development of parcels within the study area. This study is devised to facilitate the making of such development decisions, with a proposal for the creation of five separate land use districts.
- The study area is not generally conducive to agricultural pursuits; it is a heavily stream dissected peneplain predominant in sandy clay and podzal sands; soils of glaciofluvial origins.
- Existing scarce agricultural lands must be protected in the form of a Green Belt; river terrace lands which contain good black soils suitable for garden crops.
- A non-arable, Crown owned view site is recommended for country residential development. Certain administrative controls must be investigated for the mutual protection of both municipality and rural resident. Existing road networks make this proposal approachable.
- Site 4 on the plateau sector is potentially an urban reserve expansion site. The report asks that decisions governing this area be held in reserve until Fort McMurray's future population growth is established.

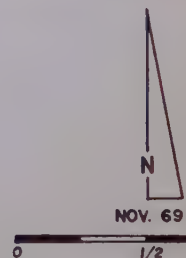
- A proposal to hold Site 5 (located along Highway 63) as a non-developable sector, would initiate the elimination of adverse highway orientated activities.
- An existing alignment of heavily treed and river bank lands, acting as buffers between the proposed uses, should be held in reserve under the auspices of Forest, Wildlife and Recreation. Sites of outstanding natural beauty can be saved for communal use.

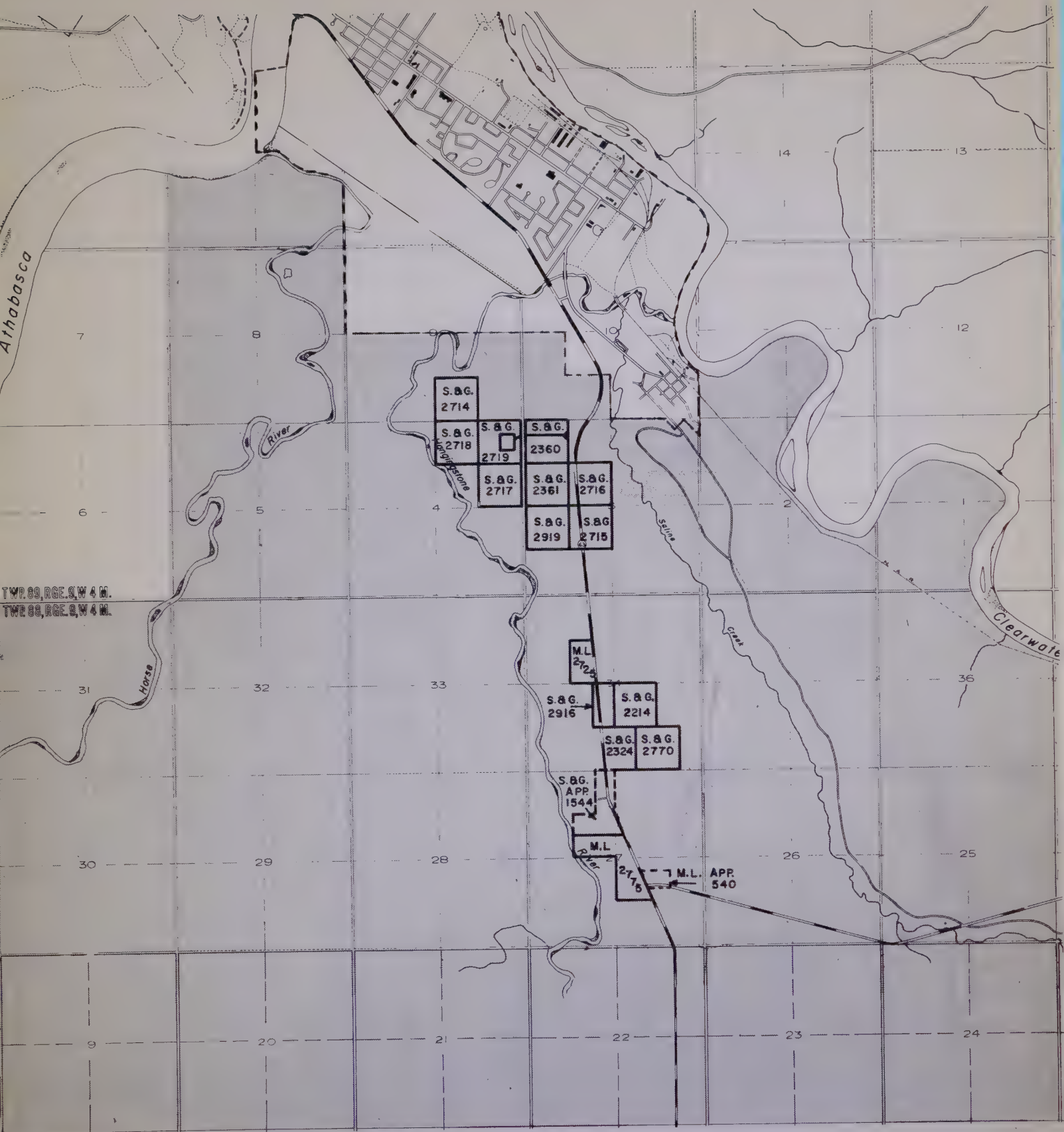


FORT McMURRAY REGION

LEASES BY MINES AND MINERALS

MAP E





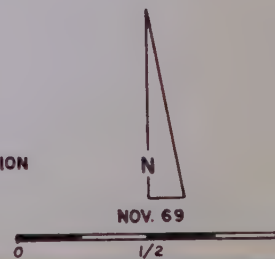
FORT McMURRAY REGION

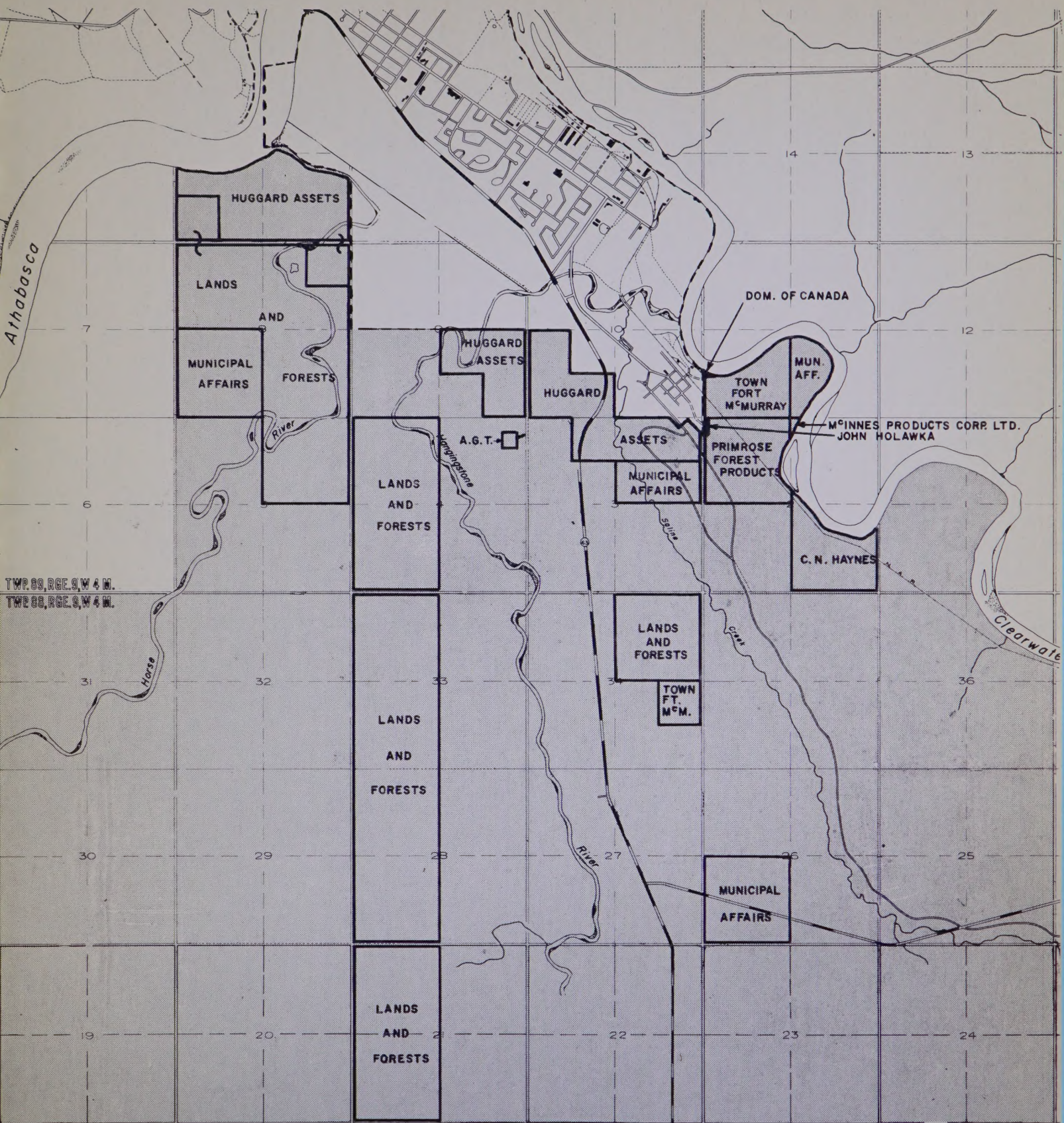
LEASES BY LANDS AND FORESTS

S.A.G. — SAND AND GRAVEL
S.A.G. APP. — SAND AND GRAVEL APPLICATION

M.L. — MISCELLANEOUS LEASE
M.L. APP. — MISCELLANEOUS LEASE APPLICATION

MAP F





FORT McMURRAY REGION

LAND TENURE BY TITLE

MAP G

NOV. 69

0 1/2

